

Outcome of Laparoscopic Cholecystectomy in Acute Calculous Cholecystitis – Analysis of 100 cases

Md Ahad Ali Mahalder^{*1}, Md Joynal Abeden², Rehnuma Karim³, Md Rafiqul Islam⁴

Abstract

Introduction: Gallbladder disease is one of the most common surgical problems worldwide. About 10-15% of the adult western population has gallstone diseases. More than half a million cholecystectomies are performed per year in United States alone. Laparoscopic cholecystectomy (LC) is currently the most widely used surgical procedure for the treatment of gallstones. **Aims and Objectives:** To observe the cause of difficulties, the sequelae, identify and find out the nature & rate of per operative complications and find out the type & frequency of early post-operative complications following laparoscopic cholecystectomy in acute calculous cholecystitis. **Materials and Methods:** This is a prospective interventional study which was conducted at Jashore Medical College Hospital & some clinics of the city from Sept 2019 to Feb 2020. A total of 100 patients underwent Laparoscopic cholecystectomy for acute calculous cholecystitis within 7 days of admission. **Results:** Among 100 patients, 80 females & 20 males with maximum age group were in the fourth decade, Laparoscopic cholecystectomy was done in 97 (97%) cases & in 3(3%) cases conversion were needed, none of the patients were developed major Per & postoperative complications. Peroperative complication rate was 22 (22%) with conversion was 03(3%) cases. All of the above complications were managed accordingly & successfully. **Conclusion:** Laparoscopic Cholecystectomy is a safe, effective procedure for the early management of patients with acute calculus cholecystitis. Meticulous dissection & good exposure of Callot's triangle, posterior clearance may prevent bile duct injuries.

Keywords: Acute calculous cholecystitis, Laparoscopic cholecystectomy, Postoperative complications.

Number of Tables: 06; **Number of Figure:** 01; **Number of Bibliography:** 20; **Number of Correspondence:** 04.

*1. Corresponding Author:

Dr. Md Ahad Ali Mahalder, FCPS (Surgery)
Assistant Professor, Dept. of Surgery
Jashore Medical College, Jashore, Bangladesh.
E-Mail: drahad09@gmail.com
Mobile: 01815-880197

2. Dr. Md Joynal Abeden

FCPS (Surgery), MS (Plastic Surgery)
Assistant Professor, Dept. of Surgery
Jashore Medical College, Jashore, Bangladesh.

3. Lt Col Rehnuma Karim, FCPS (Obs & Gynae)

Classified Specialist
CMH
Jashore Cantonment, Jashore, Bangladesh.

4. Dr. Md Rafiqul Islam, FCPS (surgery)

Assistant Professor, Dept. of Surgery
Jashore Medical College, Jashore, Bangladesh.

Introduction:

Gallbladder disease is one of the most common surgical problems worldwide. About 10-15% of the adult western population has gallstone diseases. Between 1-4% become symptomatic in a year. More than half a million cholecystectomies are performed per year in United States alone. Regional differences exist in the cholecystectomy¹. Open cholecystectomy has been performed for more than 100 years throughout the world as the standard treatment modality for cholelithiasis and symptomatic gallstone disease. After a heated debate and often uncontrolled publicity

through the media, laparoscopic cholecystectomy was officially recognized in 1987¹ is now the preferred method of cholecystectomy¹. Though the mortality and morbidity rates of laparoscopic cholecystectomy are similar to those of open cholecystectomy, but laparoscopic cholecystectomy is less traumatic, fewer post operative complication and complaints, rapid recovery, shorter hospital stay and minimal cosmetic disfigurement^{3,5}. Initially, Acute calculous cholecystitis was considered a contraindication to laparoscopic cholecystectomy. This is due to the belief that the inflammation, edema & sometimes necrosis associated with distortion of anatomy, making identification & dissection of the ductal & vascular structure difficult & there by increasing the incidence of complications. Approximately 20% of patients requiring cholecystectomy present with acute calculous cholecystitis & therefore may not be offered laparoscopic cholecystectomy. However, with increase experience & refinement of the instruments, more surgeons are performing laparoscopic cholecystectomy in patients with acute calculous cholecystitis³. The purpose of this study was to evaluate the difficulties and spectrum of complications of laparoscopic cholecystectomy in acute calculous cholecystitis cases in peroperative and early postoperative period, technique of early recognition of complications and appropriate measures taken to combat those complications & association of other co-morbid systemic diseases with acute calculous cholecystitis. Here, special attention was paid to short-term and early post operative complications.

Materials and Methods:

This study "outcome of laparoscopic cholecystectomy in acute calculus cholecystitis – Analysis of 100 cases" operated between September 2019 to Feb 2020, is designed to achieve the following objectives: to observe the sequelae of, to identify the cause of difficulties,

to find out the nature & rate of peroperative complications, to find out the type & frequency of early post-operative complications following laparoscopic cholecystectomy in acute calculous cholecystitis done in one year in an academic hospital. This study was carried out in different surgical units of Jashore Medical College Hospital and some clinics of Jashore city with signs, symptoms & investigations findings which indicate that the patient suffering from acute calculus cholecystitis. Mode of patient evaluation was personal interview, systemic questionnaire. physical examinations and investigations- Special and routine. Patients were selected randomly having symptoms of gall stone diseases. Criteria of case selection was presence of more than two of the following symptoms indicating acute cholecystitis- a) Persisting right hypochondriac pain lasting more than 24 hours b) Temp > 37°C c) Leukocyte count > 10,000/cumm d) USG criteria of acute cholecystitis- oedematous gall bladder, distended gall bladder, pericholecystic fluid collection, sub-phrenic collection

Observations and Results:

Of the 100 patients, the demographic distribution of patients are the followings- Table I shows distribution of age 20-75 years. Highest number of patients was in the fourth decade.

Table-I: Distribution of patients by age (n=100).

Age group (years)	Number of patients	Percentage
Up to 20	01	1%
21-30	11	11%
31-40	58	58%
41-50	23	23%
51-60	04	4%
61-70	02	2%
71 and more	01	1%

Pie chart shows that female are 4 times more likely to suffer from gallstone diseases than male.

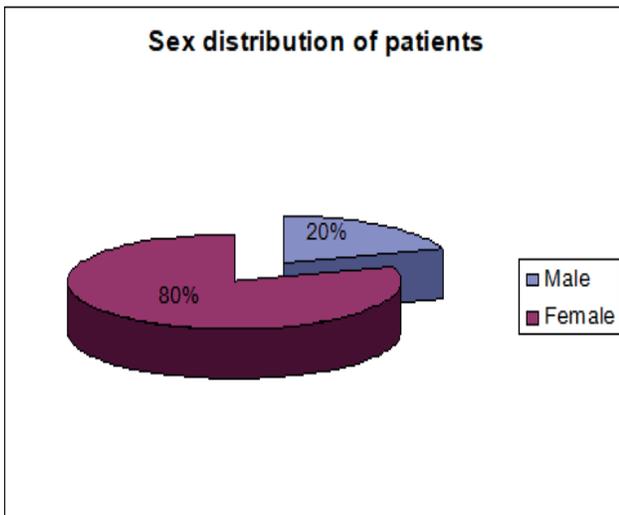


Fig-1: Pie chart of sex distribution of patients of acute gall stone.

Table-II: Peroperative complication (measures taken) of Patients at laparoscopy (n=100).

Type/ nature of problems (measures taken)	Number of Patients	Percentage
Minor complication	8	8
Gallbladder perforation with spillage of bile/pus (suction/-clipping required)	2	2
GB bed bleeding (Needs cautery, suction).	8	8
Spliage of stones (picked up & remove using condoms).	2	2
Trocer site bleeding (Needs diathermy coagulation)	2	2
Bile oozing from GB bed (needs cleaning, suction drain).	00	00
Major complication:		
Injury to the gut	00	00
Injury to the common bile duct	00	00
Total complication	22	22
No complication	75	75
Conversation required	3	3

Table III shows that Laparoscopic cholecystectomy are successfully performed in 97(97%) cases & conversion in to open cholecystectomy needed in 3(3%) cases.

Table-III: Operative methods adopted (n = 100).

Procedure adopted	Number of Patients	Percentage
Laparoscopic cholecysectomy performed	97	97
Conversion to open needed	03	03

Table-IV: Immediate postoperative complication(n=100).

Complications	Number of Patients	Percentage
Postoperative Pain (shoulder tip & back)	4	4
Bile leakage through drain (up to 48 hours postoperatively)	1	1
Wound infection (seroma/hac-matoma/discharge)	2	2
Paralytic ileus	4	4
Chest infection	3	3
Sub hepatic collection	3	3
Postoperative intraabdominal biliary leakage due to slipped clip of cystic duct	0	0
Postoperative biliary peritonitis due to unrecognized common bile duct injury	0	0
Postoperative complications	17	17
Conversion required	03	03
No postoperative complication after lap chole	80	80

Table-V: Comparison of complications (per operative).

Study	Rate of complication		Bile duct injury %	Bowel injury %	Perforation of gall bladder %	Bleeding %	Spilled gallstones %
	Major	Minor					
Erfan. et al ⁸ 1997	1	20	1	-	10	4	6
Huang et al 1997 ⁹	3.50	0.50-1	0.50	-	10	-	-
Kondoker ¹¹	1	10	1	-	5	4	5
Akter Quamrul MS. 2004 ¹⁵	0	23	0	0	10	06	05
Present study 2000	0	22	0	0	8	2	8

Comparison of complications have shown that rate of complication is almost similar, but there is much improvement regarding major complications like bile duct injury which is the most grievous complication of Laparoscopic Cholecystectomy. In our study, there is no bile duct injury and no per-operative mortality.

Table-VI: Comparison of complications (post operative).

Study	Shoulder tip/back pain (%)	Subhepatic collection (%)	Wound infection (%)	Subcutaneous emphysema (%)	Prolonged ileus (%)	Chest Infection (%)
Erfan. et al ⁸ 1997	8	-	6	-	-	-
Huang et al 1997 ⁹	10.00	0.50	1.50	1.50	0.50	-
Kondoker ¹¹	6	-	1	2	1	-
Akter Quamrul MS. 2004 ¹⁵	5	2	3	0	2	2
Present study 2000	4	3	2	0	4	3

Comparison of post operative complication have shown that rate of complications are almost similar.

Discussion:

Laparoscopic cholecystectomy (LC) has rapidly emerged as the standard treatment for symptomatic gall stones⁴. It is less traumatic than open cholecystectomy resulting in fewer post operative complaints, rapid recovery, shorter hospital stay & minimal cosmetic disfigurement. Initially Acute Calculous Cholecystitis (ACC) was considered a contraindication to LC³. This is due to the belief that the inflammation, oedema & sometimes necrosis associated with ACC distort the anatomy, making identification & dissection of the ductal & vascular structures difficult & there by increasing the incidence of complications. Approximately 20% of patients requiring cholecystectomy at presentation with acute calculous cholecystitis & therefore may not be offered LC. However, with increased experience & refinement of the instruments, more surgeons are performing LC in patients with ACC³. About 3-10 percent cases may need conversion into open cholecystectomy for successful completion of cholecystectomy or to overcome varying problems that a surgeon may encounter during the laparoscopic procedure^{9,10}. The present study

consisted of 100 patients of acute calculous cholecystitis selected on the basis of clinical, haematological & radiological criteria. They underwent laparoscopic cholecystectomy and the results were evaluated to show that laparoscopic cholecystectomy of acute calculous cholecystitis is safe and effective and enjoy the same benefits as compared with those undergoing elective laparoscopic cholecystectomy. The pain was significantly less and post operative recovery was early. Peroperative & early post operative complication was significantly less and manageable. Age distribution of 100 patients ranged from 20 to 75 years with highest number of patients in the fourth decade, which is accurate gallstone disease prone age. Females were 4 times more commonly affected than males. Every patients was investigated with white blood cell count, differential count, serum bilirubin, ultrasonography of HBS and pancreas, alkaline phosphatase, SGPT, PT etc of LFT for those patients given history of jaundice. Ultrasonogram of HBS and pancreas in 100 patients had shown oedematus gall bladder in 68 (68%), empyema gall bladder in 2 (2%), distended gall bladder in 10 (10%), oedematus gall bladder with biliary sludge 18%, pericholecystic fluid collection 2(2%) cases. All patients showed single or multiple echogenic strictures with in the lumen of gall bladder. Among the 100 patients, systemic illness were observed in 20 (20%) patients, out of which 5 (5%) were hypertensive, 15 (15%) were known diabetic. All these systemic co-morbid problems were successfully managed peroperatively. None of these patients developed peroperative and postoperative complications regarding associated co-morbid systemic disease. Out of 100 patients, laparoscopic cholecystectomy was done in 97(97%) cases, and in 3(3%) cases conversion was needed for some preoperative complications densely adhered gall bladder with preoperative bleeding from GB bed & perforated gall bladder. Peroperative problems were experienced in 65(65%) patients. Most common problems were tense gall bladder containing bile, pus or mucus in 35(35%). Aspiration was done before careful dissection. Densely omental adhesion present in 15 (15%) patients requiring slow and meticulous dissection. 2 of them required conversion as structures (gut, omentum, etc) were so densely adhered that they could not be identified properly. Too big gallstone was seen in 12(12%) cases and problems during passing through epigastric port was solved by enlarging the port by large artery forceps. In 3(3%) case, the gallbladder wall was found thick & gangrenous & difficult to grasp & required very careful dissection. Perforated gallbladder was found in one case, to whom conversion done immediately. Peroperative problems were more among recurrent and late admitted patients. Peroperative problems had overcome by efficient work of the operating surgeon. Morbidity for laparoscopic cholecystectomy was 23% this complications included those related to laparoscopic & those related to actual cholecystectomy. The most important complications related to laparoscopic cholecystectomy are bile duct injury, bile leakage, retained common bile duct stones, GB perforation, intra operative & post operative hemorrhage & wound

infection^{1,10}.

Common bile duct injury to the extrahepatic biliary tree remains one of the most devastating complications regarding long term morbidity. A bile duct injury subjects the patient to the immediate risk of a major biliary reconstruction as well as lifelong risk of recurrent stricture formation. The reported incidence of bile duct injury following laparoscopic cholecystectomy ranged from 0 to 0.5 percent^{1,8}. In the present series, common bile duct injury occurred in 0 (0%) cases, which is absolutely lower than reported range & other reports^{1,10}. Postoperative bileleakage have been reported to occur in 0.2 to 3.3 percent of the patients managed by Lap-chole^{3,5}. Such leakage usually originates from the cystic duct and may occur as a result of dislodgement of loosely packed haemoclip or necrosis of the cystic duct stump. Bile leakage may also originate from an unrecognized accessory hepatic duct or directly from liver bed⁶. Gallbladder Perforation was encountered in 8 (8%) cases in the present series which were managed by proper suction of bile, mucus pus from peritoneal cavity, clipping of perforation sites. The present value was much lower than other reports^{5,8}. But consistent with another report¹¹. The causes of gallbladder perforation in present series were during severe retraction or swift dissection of gallbladder from liver bed or during its removal through umbilical port. Sub hepatic collection was encountered in the present series was encountered 3 (3%) case. It was detected by abdominal pain, tenderness, persistent shoulder tip pain, fever & ultrasonogram, which was managed by conservative treatment with analgesics and antibiotics. Condition was improved by 7 days. The results of the present series is more than the reported value^{10,4}. Spillage of stone during LC was encountered in 08(8%) cases. The present value is higher than the reported values^{8,11}. Peroperative bleeding was found in the present series in 4 (4%) cases- bleeding from gallbladder bed in 2(2%) cases and trocar site bleeding in 2(2%) cases and managed by pressure and diathermy cautery. The result of the present series is higher than reported series⁴. Postoperative shoulder tip/back pain following laparoscopic cholecystectomy is not uncommon. In the present series, it was seen in 4 (4%) cases, which is lower than the reported series at the time of laparoscopic cholecystectomy, gallbladder perforation with leakage of bile and / or gallstone into abdominal cavity occurred frequently due to secondary to traction applied by grasping forceps or because of diathermy injury during dissection of gallbladder from its bed. This situation causes prolonging the operation time in variable lengths (due to time required for aspiration, cleaning of bile from abdominal cavity (Khondoker¹¹. Huan et al⁴. And Erfan⁸). They were self-limiting and in most of the cases, pain was relieved by usual analgesic.

The incidence of wound infection (seroma/haematoma/discharge) in the present series 3(3%) percent and higher than the reported series^{3,16}, but lower than the other series¹⁷. Paralytic ileus is one of the frequent complications following LC. In the present series, 4 (4%) case developed

paralytic ileus which was managed by conservative treatment, and which is comparable to Kondoker¹¹ but more than Huang⁴ et al. and Z'graggen K¹⁹. Chest infection occurred in 3(3%) case which was managed by chest physiotherapy and which is much lower than Watson et al¹⁴.

The conversion rate of the present series was 3 (3%) which is significantly lower than the reported 5.3 (5.3%) percent⁷. Average time required for laparoscopic cholecystectomy was 45 minutes with a range of 30-110 minutes. Longer time was required in cases of having severe adhesion. The result is significantly lower than other reported series². Average postoperative hospital stay 2.5 days which was lower than some study¹³. The overall complication rate in the present series is 17 (17%) and can be compared favorably with morbidity rate from conventional cholecystectomy rate (6-35%)¹⁸. There was no mortality in the present series, which is comparable to open cholecystectomy (0-4.8%)¹². By comparing and considering the spectrum of complications of laparoscopic cholecystectomy which are avoidable & manageable²⁰, if we had thorough knowledge of complications and had carefully follow the principle of Laparoscopic cholecystectomy.

Conclusion:

Careful & meticulous dissection of the critical callot's triangle is essential to avoid technical errors, and intraoperative cholangiography may further clarify anatomical relationship. Most cases of acute calculous cholecystitis can be safely managed by laparoscopic cholecystectomy. So, from present series we can say laparoscopic cholecystectomy is safe in early acute calculous cholecystitis admitted within 7 days of symptom appears and the complication rate is not higher than that for elective laparoscopic cholecystectomy or open cholecystectomy. Most of the complications are preventable by experienced team. Meticulous dissection, clear exposure of callot's triangle, judicious use of diathermy and appropriate clip application and the use of peroperative cholangiography can prevent late diagnosis of bile duct injury & management accordingly. To get better outcome, ensure safety & efficacy of laparoscopic cholecystectomy in acute calculous cholecystitis. The procedure should be performed by an experienced surgeon as soon as the diagnosis is established, in a well equipped centre preferably within 3 days of the onset of symptoms.

Conflict of Interest: None.

Acknowledgement:

The authors gratefully acknowledge the teachers, interns and patients for helping with valuable suggestions and documentation.

Bibliography:

1. Habib Mahmoud. Early Laparoscopic Cholecystectomy for Acute Versus Chronic Cholecystitis : A Prospective Comparative Study. Kuwait Medical Journal. 2004; 36 (4) : 281:284.
2. Acosta AS, Fares RG, Arguellar VG. Laparoscopic cholecystectomy: a safe treatment option or a passing fancy. Proceedings MMC. 1992; 6:9;-14.

3. Abdullah Adulmohsen Al-Mulhin. Laparoscopic cholecystectomy is feasible & safe in acute cholecystitis. The Saudi Journal of Gastroenterology. 1996; 5 : 56-60
4. Huang CS, Tai FC, Shi MY, Chen DF, Wang NY. Complication of laparoscopic cholecystectomy: an analysis of 200 cases. J Formosan Med Assoc. 1992; 91: 785-92.
5. Crist D W, Gadacz TR. Complications of laparoscopic surgery. Surg Clin N Am. 1993; 73:265-88.
[https://doi.org/10.1016/S0039-6109\(16\)45981-5](https://doi.org/10.1016/S0039-6109(16)45981-5)
6. Guyton AC. Text book of Medical physiology. 9th ed. WB saunders company; 1991:720-3.
7. Boulay J, Schellenberg R, Brady DG. Role of ERCP and therapeutic biliary endoscopy in association with laparoscopic cholecystectomy. Am J Gastroenterol. 1992; 87; 837-41.
8. Erfan SMA. Early complications of laparoscopic cholecystectomy. a prospective study of 100 cases [dissertation]. Dhaka: Bangladesh College of physicians and Surgeons, 1997.
9. Sanakana JR, Gallingers, Croxford R, Strasberg SM. Risk factors in elective laparoscopic cholecystectomy for conversion to open cholecystectomy. J Am Coll Surg. 1994; 179:696 -704.
10. Elder Samuel, MD, Eitan Arien, MD, Bickel Amitai, MD, Sabo Edmond, MD, Cohen Ayala, PhD, Abrahamson Jack, FRCS, FACS, et al. The Impact of Patient Delay & Physician Delay on the Outcome of laparoscopic cholecystectomy for acute cholecystitis. The American Journal of Surgery. 1999 Oct. ;178 : 303-307.
[https://doi.org/10.1016/S0002-9610\(99\)00172-5](https://doi.org/10.1016/S0002-9610(99)00172-5)
11. Kondoker MS. Early complications of laparoscopic cholecystectomy. a study of 100 cases [dissertation]. Dhaka : Bangladesh College of physicians and Surgeons; 1995.
12. Joses DB, Soper NJ. Complication of laparoscopic cholecystectomy Ann Rev Med. 1991; 161: 31-44.
13. Lee VS, Chari RS, Cucchizaro G, Meyers WC. Complications of laparoscopic Cholecystctomy. Am J Surg. 1993; 165:527-31.
[https://doi.org/10.1016/S0002-9610\(05\)80955-9](https://doi.org/10.1016/S0002-9610(05)80955-9)
14. Watson DI, Mathew G, Williams JAR. Impact of laparoscopic Cholecystctomy in major teaching hospital: clinical and hospital outcomes. Med J Aust. 1995; 163: 527-30.
<https://doi.org/10.5694/j.1326-5377.1995.tb124719.x>
PMid:8538523
15. Akhter Kamrul M S. Consequences of Laparoscopic Cholecystectomy in Acute Gall Stone Diseases Study of 100 Cases (Dissertation) Dhaka : Bangladesh College of physicians and Surgeons;2004.
16. Ihsaz M, Hung CM, Regoly -Merei J, Fazekas T, Batorfi J, Balint A, et al. Complications of laparoscopic cholecystectomy in Hungery: a multicentre study of 13, 833 patients. Eur J surg. 1997; 163: 267-74.
17. Collet D, Edey M, perissat J. Conversions laparoscopic and complications of laparoscopic cholecystectomy: results of a survey conducted by the French Society of Endoscopic Surgery and Interventional Radiology. Surg Endosc. 1993; 7:334-8.
<https://doi.org/10.1007/BF00725952>
PMid:8351608
18. Cloven PA. Recent result of elective open cholecystectomy a North American and European center. Ann Surg. 1992; 216: 618-25.
<https://doi.org/10.1097/00000658-199212000-00002>
PMid:1466614 PMCID:PMC1242707
19. Z'graggen K, Wehrli H, Metzger A, Buehler M, Frei E, Klaiber C. Complications of laparoscopic cholecystectomy in switzerland: a prospective 3 years. Study of 10, 174 patients. Surgery, Endosc. 1998; 12:1303-10.
<https://doi.org/10.1007/s004649900846>
PMid:9788852
20. Lee VS, Chari RS, Cucchizaro G, Meyers WC. Complications of laparoscopic Cholecystctomy. Am J Surg. 1993; 165:527-31.
[https://doi.org/10.1016/S0002-9610\(05\)80955-9](https://doi.org/10.1016/S0002-9610(05)80955-9)